

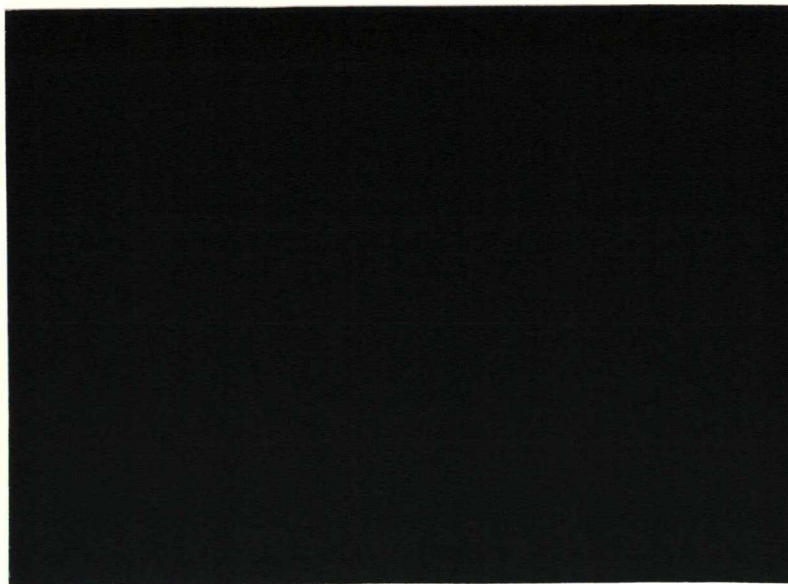
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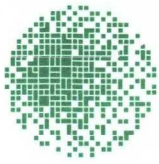
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INTERIM MEASURES WORKPLAN

BURLINGTON ENVIRONMENTAL INC.
PIER 91 FACILITY

2001 West Garfield Street, Seattle, WA
WAD 000 812 917

JUNE 15, 1994
DRAFT



**BURLINGTON
ENVIRONMENTAL**
A Philip Environmental Company

LUAD 2917
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June 15, 1994

CERTIFIED MAIL

Mr. David Croxton
U.S. EPA
1200 Sixth Avenue, M/S HW-106
Seattle, WA 98101

RECEIVED
JUN 16 1994

RCRA PERMITS SECTION

Mr. Croxton:

Enclosed are two copies of Draft Interim Measures Workplan for the Burlington Environmental Inc. Pier 91 Facility. This workplan has been prepared in accordance with Section VI.B.1. of the Burlington RCRA 3008(h) Order as requested by letter from Michael Gearheard (USEPA X) to Richard Lavoie (Burlington) dated March 29, 1994.

If you have any questions please contact me at (206) 227-6121.

Sincerely,

John Stiller
Project Coordinator

cc: Galen Tritt - Ecology NWRO
Doug Hotchkiss - Port of Seattle



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- 9-1 Project Schedule

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This Interim Measures Workplan has been prepared in accordance with Section VI.B.1. of the Burlington Environmental Inc. (Burlington) Pier 91 Facility RCRA Section 3008(h) Order [USEPA Docket No. 1089-11-06-3008(h)], as requested by letter from Michael Gearheard (USEPA X) to Richard Lavoie (Burlington) dated March 29, 1994. The USEPA has directed that the interim measures program recover light non-aqueous phase liquids (LNAPL) present on the upper (water table) aquifer beneath the tank system using existing groundwater monitoring wells.

1.1 Facility Setting

The Burlington Pier 91 Facility is located within the Port of Seattle (Port) Terminal 91 facility. The Terminal 91 facility is located at the south end of a topographic low known as the Interbay area, with Queen Anne Hill to the east, Magnolia Hill to the west, and Elliot Bay to the south (see Figure 1-1). The Interbay lowland area extends from the Lake Washington ship canal on the north, to Elliot Bay on the south, and is approximately 1.5 miles long and 1,000 to 2,000 feet wide. Fill has been added over a large portion of the Interbay lowland area. The Burlington Pier 91 Facility is believed to overlie a portion of the Smith Cove inlet of Elliot Bay, modified by fill in the early 1900's.

Surface water bodies in the vicinity of the Burlington facility include Lake Jacobs, an artificial pond, and Elliot Bay, a natural saltwater body on Puget Sound. Lake Jacobs is a semi-rectangular shaped depression approximately 100 feet south of the facility immediately south of the Garfield Street viaduct. Lake Jacobs was created when a portion of Smith Cove (Elliot Bay) between adjacent Piers 90 and 91 was filled in to create the Terminal 91 Short Fill area.

1.2 Facility Description

The facility tank system is divided into three areas each surrounded by concrete containment walls, with the ground surface covered by either asphalt or concrete (see Figure 1-2). The tank system and related buildings cover approximately four acres within the east central portion of the 124 acre Port of Seattle Terminal 91 property.

The tank system was originally constructed in 1926 for use as a gasoline refinery and fuel transfer facility. The U.S Navy operated at the facility from 1941 to 1972, following which the Port of Seattle took possession of the property. Burlington began leasing the tank system in 1971 and has subleased a major portion of the tankage to Pacific Northern Oil (PNO) since 1973. Burlington and PNO have historically operated the tank system for the recovery and processing of waste oil and waste water, and for the bunkering of marine vessels.

1.3 Previous Investigations

Three hydrogeologic investigations have been completed regarding the Burlington facility. Numerous other investigations relating to building construction, UST removal, placement of structural fill, and pipeline breaks have been completed throughout the 124 acre property on behalf of the Port and PNO.

The Sweet, Edwards and Associates May 1988 Phase I Hydrogeological Investigation preceded the Burlington RCRA Section 3013 Order dated June 30, 1988, and was limited to placing six shallow monitoring wells and sampling of sludges from several tanks. The Sweet Edwards/EMCON Phase II Hydrogeological Investigation was completed in April 1989 to satisfy the 3013 Order. Work included placing four shallow and two deep monitoring wells and completing multiple soil characterization borings. The third investigation is the RCRA Facility Investigation (RFI) completed in 1993 by the Burlington Environmental Inc. Technical Services Division. This RFI was developed in accordance with the May 1, 1990 Burlington RCRA 3008(h)

Order. The scope included a tidal study, pumping test, placing of several wells, further soil characterization, and sampling of stormwater catch basins.

Four stratigraphic units have been identified beneath the Burlington facility; a shallow fine to medium sand unit believed to be fill material, a native fine to fine-medium silty sand unit, a native deep medium-course to gravely sand unit, and a native fine silty sand and silty clayey sand unit. The upper two units are horizontally continuous across the facility. The third unit is not present in the northeast portion of the facility, and the horizontal and vertical extent of the fourth unit has not been fully assessed.

Four hydrostratigraphic units have also been identified; a shallow unconfined aquifer in shallow fine to medium sand fill unit, an upper confining unit (aquitard) comprised of the native fine to fine-medium silty sand unit, a deep confined aquifer in the native deep medium-course to gravely sand unit, and a lower confining unit comprised of the native fine silty sand and silty clayey sand unit.

The upper unconfined aquifer is five to seven feet below ground surface, flows generally to the southwest, and is not tidally influenced. The lower aquifer is eight to twelve feet below ground surface, flows generally to the south, and is tidally influenced with the greatest effect in the southeast decreasing rapidly with distance to the northwest. The horizontal seepage velocity in the upper aquifer is estimated at 35 ft/yr, not accounting for the effects of dispersion. Hydraulic head values in the shallow and deep aquifers indicate a downward hydraulic gradient across the upper confining unit. The scheduled pumping test will provide a precise vertical rate and will confirm that the upper aquitard is continuous.

The contaminants detected in soils are primarily VOCs consisting of chlorinated and BTEX compounds. CVOCs present include methylene chloride, perchloroethane, trichloroethane typically at <1,000 ug/kg with local hot spots as high as 5,000 ug/kg. The highest CVOC concentrations are in the northeastern and central parts of the facility and generally decrease with depth. The highest BTEX concentrations are in the north-

central and central parts of the facility and are at less than 20 feet bgs. Benzene ranges from 73 - 910 ug/kg, toluene from 1 - 140,000 ug/kg, ethyl benzene from 4 - 530,000 ug/kg, and xylene from 2 - 630,000 ug/kg. Non-chlorinated VOCs detected include methyl ethyl ketone (2-butanone) and acetone found in shallow soils ranging from 7 - 32,000 ug/kg.

The primary SVOCs detected in the soils are PAHs, which are widespread in the shallow soils from 25,000 - 200,000 ug/kg. TPH is present throughout the site with highest concentration in the north-central and central parts of the facility. Concentrations decrease with depth and range from 14 - 120,000 mg/kg. PCBs are present in the central small yard and in the southern black oil yard at <1 mg/kg. At one location in the small yard PCBs were detected at 3 - 85 mg/kg.

The metals detected in the soils and their concentrations (total) in mg/kg are as follows: Silver (n.d. - 0.4), Arsenic (0.6 - 13), Barium (11 - 271), Beryllium (0.2 - 0.6), Cadmium (0.2 - 4), Chromium (10 - 96), Copper (4 - 54), Mercury (0.02 - 0.16), Nickel (12 - 48), Lead (0.9 - 326), Zinc (13 - 395).

Contaminants detected in the shallow groundwater include CVOCs 1,1-dichloroethane, chloroethane, 1,1,1-trichloroethane, trichloroethane, methylene chloride, and vinyl chloride with most being below the established MCL. Vinyl chloride is present at 4 - 39 ug/L, above the MCL of 2 ug/L, and TCE is present at 7 - 49 ug/L above the MCL of 5 ug/L. The highest CVOC concentrations are in the northeastern and central parts of the facility. BTEX compounds are also present but below their MCLs (5 ug/L, 1000 ug/L, 700 ug/L, 10,000 ug/L respectively), except at one well in the small yard where BTEX levels were 2-4 times the MCLs.

The total SVOC concentrations in the shallow groundwater range from 50 - 400 ug/L and consist primarily of PAHs. The highest SVOC concentrations are in the central portion of the facility. TPH concentrations vary from 1 - 190 ug/L primarily in the central portion of the facility. PCBs were detected in one well (CP-119) at 0.4 ug/L below the MCL of 0.5 ug/L.

No dissolved metals were detected in the shallow groundwater, however, total metals concentrations in mg/L follow: Arsenic (0.01, MCL=0.05), Chromium (0.016, MCL=0.1), Copper (0.067, SMCL=1.0), Lead (0.012, MCL=0.015), Zinc (0.058, SMCL=5.0).

In the deep groundwater aquifer, the only VOC detected above the MCL was trichloroethane at 27 ug/L with the MCL at 0.05 ug/L. BTEX compounds are present below their respective MCLs. The only SVOCs detected was a phthalate and it is believed to laboratory contamination. TPH was non-detect. No PCBs were present. Total metals analysis indicate the presence of copper, chromium, lead, nickel, and zinc all below their MCLs/SMCLs.

LNAPLs are present in the shallow aquifer along the western and central portions of the facility measured at 0.06 to 1.4 feet thick. No LNAPLs are present in the deep aquifer. No DNAPLs have been detected in either aquifer.

The objectives of the proposed interim measures are to recover light non-aqueous phase liquids (LNAPLs) present on the upper (water table) aquifer beneath the tank system. This will be accomplished using existing wells to allow implementation without additional plume characterization or well installation. The proposed interim measures are intended to stabilize conditions on site, and to be consistent with and support long-term corrective measures.

The LNAPL recovery system design objectives are to maximize the amount of product recovered while minimizing the amount of groundwater collected and ultimately discharged under Burlington's POTW permit. Further, the system is designed to operate with minimal labor oversight and impact to ongoing facility operations.

3 HEALTH AND SAFETY PLAN

Burlington will follow the Health and Safety Plan presented in the April 1992, *RCRA Facility Investigation Workplan, Burlington Environmental Inc. Pier 91 Facility, Seattle, WA*, as needed and appropriate.

4 COMMUNITY RELATIONS PLAN

Burlington will follow the Community Relations Plan presented in the April 1992, *RCRA Facility Investigation Workplan, Burlington Environmental Inc. Pier 91 Facility, Seattle, WA*, as needed and appropriate.

5 DATA COLLECTION QUALITY ASSURANCE PLAN

Burlington will follow the Data Collection Quality Assurance Plan presented in the April 1992, *RCRA Facility Investigation Workplan, Burlington Environmental Inc. Pier 91 Facility, Seattle, WA*, as needed and appropriate.

6 DATA MANAGEMENT PLAN

Burlington will follow the Data Management Plan presented in the April 1992, *RCRA Facility Investigation Workplan, Burlington Environmental Inc. Pier 91 Facility, Seattle, WA*, as needed and appropriate.

7.1 Pneumatic Pump Control Specifications

The unit shall be capable of controlling multiple wells with additional satellite controllers installed at each pump (well). The unit shall have timed pump and fill cycles with a pump cycle range of approximately one second to three minutes and a fill cycle range of approximately one second to thirty minutes.

The unit shall have a pilot operated poppet type air valve capable of delivering 75 scfm air flow at 125 psi, and shall have a minimum operating pressure of 55 psi and be capable of operating at a maximum pressure of 125 psi.

The control shall be fully pneumatic, requiring no electricity to operate, and shall be housed in a NEMA rated non-metallic watertight enclosure, measuring 10" high x 8" wide x 5" deep.

The above specifications are met by a TME Model PC-1T Pneumatic Pump Control unit, and a TME Model MWM-4 Multiple Well Manifold. Refer to Figure 7-1.

7.2 Satellite Controller and Well Closure Specifications

The satellite controller shall be fully pneumatic, requiring no electricity to operate. The unit shall be capable of delivering air supply to either a TME Model 2SK2 Skimming Pump assembly when the unit receives a logic signal from a TME Model PC-1T Pneumatic Control unit.

The satellite controller shall have a pilot operated poppet type air valve capable of delivering 75 scfm air flow at 125 psi, and shall have a pressure regulator with a 0-160 psi pressure gauge.

The well closure unit shall be designed to fit on top of the well casing. The well closure unit shall have compatible connections for the satellite controller and skimming pump assembly and be capable of suspending the pump assembly.

The above specifications are met by a TME Model ST-1 Satellite Controller and a TME Model 2WC2-S Well Closure. Refer to Figure 7-2, Figure 7-3, and Figure 7-4.

7.3 Product Skimming Pump Specifications

The control shall be fully pneumatic, requiring no electricity to operate, and shall be capable of pumping dry without damage. The pump shall be 1.75 inches in diameter to accommodate installation in a two-inch or larger well. The pump body shall be 24 inches in length with 56 inches being the total length of the pump and skimming assembly, and shall be equipped to accept a suspension cable.

The pump shall be constructed of stainless steel with Teflon intake and discharge check valve balls and Buna-N o-ring seals. The pump shall have a top intake with all check valves being enclosed internally within the pump body. The pump shall be equipped with two hose barb fittings for 1/4 inch I.D. air supply and fluid discharge hose connections.

The skimming assemble shall have a floating hydrophobic (water repelling) filter with 24 inches of travel to accommodate fluid level fluctuations in the well.

The above specifications are met by a TME Model 2SK2 Product Skimming Pump. Refer to Figure 7-5.

7.4 Overfill Protection Control Specifications

The unit shall be capable of deactivating the pneumatic pumping system by terminating the air supply to the pump control in the event of a high fluid level condition in the holding tank. The downstream pressure between the overfill protection control and the pneumatic pump control system shall be exhausted, completely disabling the pumping system.

The overfill protection control will be furnished with an intrinsically safe Buna-N float switch assembly and fifty feet of cable. The float switch assembly shall be capable of being installed in a two-inch NPT opening. The control shall be housed in a NEMA 4X rated non-metallic watertight enclosure, measuring 10" high x 6.5" wide x 5" deep.

The overfill protection control shall have a solenoid operated poppet type air valve capable of delivering 75 scfm air flow at 125 psi, and shall be capable of operating at a maximum pressure of 125 psi.

The above specifications are met by a TME Model TF-120V Overfill Protection Control system. Refer to Figure 7-6 and Figure 7-7.

8.1 General System Description

Product recovery pumps and associated control lines will be installed in wells CP-107, CP-109, CP-110, CP-116, CP-117, CP-118, CP-119, and MW-39-3. Each of the two system controllers will monitor four wells with each well having a separate air supply and air logic control line. The product recovery lines will be manifolded, and returned to a 550 gallon recovery tank, equipped with an overfill protection system. The tank will be located in the north central portion of the existing RCRA tank system secondary containment area. The two controllers will be located in the vicinity of the product recovery tank. The air supply, logic control, and product recovery lines will be housed inside conduit placed above ground within the facility, and below ground outside the facility to accommodate wells CP-107, CP-110, and MW-39-3. Refer to Figure 8-1 and Figure 8-2.

8.2 Installation of Components

8.2.1 Pump Control, Overfill Protection, Manifold Assembly

The TME Model PC-1T Pneumatic Pump Control unit and the TME Model TF-120V Tank Overfill Protection unit panels should be securely mounted and isolated from vibration. Mounting holes are molded into the enclosures at each corner. Machine, wood or sheet metal screws may be used.

Connect the 3/4" Buna-N air line from the compressed air supply to the "Air In" port of the TF-120V Tank Overfill Protection unit.

Connect the 1/2" Buna-N air line from the "Air Out" port of the TF-120V Tank Overfill Protection unit to the pressure regulator/filter at the "Air In" port of the PC-1T Pneumatic Pump Control unit.

Connect the MWM-4 multiple pump manifold to the "Air Out" port of the PC-1T Pneumatic Pump Control unit.

Connect the logic control lines (3/8" polyethylene tubing) to the MWM-4 multiple pump manifold.

8.2.2 Satellite Controller, Skimming Pump, Well Closure

The TME Model ST-1 Satellite Controller is located at the well head and attached externally to the TME Model 2WC2-S Well Closure. The TME Model 2SK2 Skimming Pump is located within the well.

Connect the logic control line (3/8" polyethylene tubing) from the MWM-4 multiple pump manifold to the 3/8" quick-connect on the ST-1 Satellite Controller;

NOTE: the logic control lines from the WMW-4 manifold to each ST-1 Satellite Controller must be the same length for the pumps to operate properly. Coil the excess logic control line tubing in the well head.

Connect the 3/4" Buna-N air line from the compressed air supply to the regulator on the ST-1 Satellite Controller.

Connect the discharge and air supply hoses and suspension cable to the 2SK2 Skimming Pump as follows.

Attach the suspension cable to the eyebolt on 2SK2 Skimming Pump;

Connect the 1/4" Buna-N discharge hose to the 1/4" hose barb fitting on the 2SK2 Skimming Pump;

Connect the 1/4" Buna-N air supply hose to the 1/4" hose barb fitting on the 2SK2 Skimming Pump;

Bundle the 1/4" discharge hose, 1/4" air supply hose, and the suspension cable with two nylon (or equivalent) ties located approximately 4 feet apart;

Cut the 1/4" discharge hose, 1/4" air supply hose and the suspension cable to the proper length to position the 2SK2 Skimming Pump at the desired depth in the well (as specified by the Project Engineer), making sure to leave enough excess to make the connections to the 2WC2-S Well Closure. The pump should be positioned such that floating

hydrophobic filter has sufficient travel within its 24-inch range to accommodate the anticipated fluid level fluctuations for that well.

Make the following connections to the underside of the 2WC2-S Well Closure.

Attach the 2SK2 Skimming Pump suspension cable to the eyebolt;

Connect the Buna-N discharge hose from the 2SK2 Skimming Pump to the 1/4" hose barb fitting;

Connect the Buna-N air supply hose from the 2SK2 Skimming Pump to the 1/4" hose barb fitting.

Lower the assembled 2SK2 Skimming Pump into the well and slip the 2WC2-S Well Closure into place on top of the well casing.

Make the following connections to the top (exterior) of the 2WC2-S Well Closure.

Connect the female air coupling on the ST-1 Satellite Controller to male air coupling on the 2WC2-S Well Closure;

Connect the 1/2" Buna-N discharge hose to 1/2" hose barb fitting on the 2WC2-S Well Closure.

Make the following final connections.

Install the final 1/2" Buna-N discharge hose manifolded from the eight wells into product storage tank;

Install the intrinsically safe float switch assembly (remote sensor to TF-120V Tank Overfill Protection unit) into the product storage tank;

Make the electrical connection from the circuit breaker panel to the TF-120V Tank Overfill Protection unit.

8.3 System Start Up

The system design permits the pumping rate for each well to be adjusted optimizing the quantity of product recovered. The eight wells will be started one at a time to establish their individual optimal pumping rate. After all wells are on line and operational, the overall system performance will be monitored as described in Section 8.5, Performance Monitoring.

The following steps will be completed for start up of the system.

Start the flow of air from the compressed air supply to the TF-120V Tank Overfill Protection unit. Assure that the compressed air is reaching the PC-1T Pneumatic Pump Control unit;

Set the air supply pressure regulator on the PC-1T Pneumatic Pump Control unit at 60 psi. The minimum operating pressure of the PC-1T is 60 psi. Do not exceed 125 psi;

Set the air pressure at each ST-1 Satellite Controller at 18 psi;

Set the "FILL" and "PUMP" time cycles on the PC-1T Pneumatic Pump Control unit as follows;

Observe the control pressure gauge on the PC-1T Pneumatic Pump Control unit. The pressure will rise to approximately 40 psi, the control valve will shift, and the pressure will fall to approximately 20 psi. The cycle will then repeat. The rise in pressure indicates the "FILL" cycle of the pump and the fall in pressure indicates the "PUMP" cycle of the pump.

Turning the "FILL" and "PUMP" knobs on the PC-1T Pneumatic Pump Control unit adjusts the time it takes for the pressure to rise (fill cycle) and to fall (pump cycle). Turning the knob clockwise increases the time, turning the knob counterclockwise decreases the time.

Adjust the "FILL" time cycle to allow the pump to completely fill. Depending on the recharge rate of the well, 15 or 20 seconds is usually sufficient.

Increase the "PUMP" cycle time until the pump starts to blow air at the end of the cycle, then decrease the time until the pump stops blowing air.

Decrease the "FILL" cycle time until pump starts to blow air, then increase time until the pump stops blowing air.

If a problem in adjusting the "FILL" or "PUMP" cycle times becomes apparent, verify all tubing connections for the affected equipment and readjust the cycle times.

The pumping system is now operating. To shut off the system, shut off the air supply.

8.4 Maintenance

The following maintenance items will be performed as scheduled for optimum system performance.

Check the adjustment of the "FILL" and "PUMP" cycle times daily (PC-1T Pneumatic Pump Control) for at least one week until the system stabilizes. After stabilization, check the adjustment of these cycle times weekly.

Inspect each ST-1 Satellite Controller monthly to verify proper operation. Compressed air condensate in the ST-1 Satellite Controller will be the most probable cause of operational failure. To correct, disconnect the ST-1 at the air coupling on the 2WC2-S Well Closure, and disassemble to remove the water. The "FILL" and "PUMP" cycle times may need adjustment after reassembling.

The product level in the 550 gallon product storage tank will be checked at least weekly. Product is to be removed before it reaches the 500 gallon level. The air supply to the system will be turned off while product is being removed from the storage tank.

The 2SK2 Skimmer Pumps are scheduled to be removed from the wells on a periodic basis to measure the water and product levels. The hydrophobic filter will also be checked and replaced as necessary. The removal procedure is as follows.

Shut off the air supply at the PC-1T Pneumatic Pump Control;

Disconnect the discharge line and the ST-1 Satellite Controller from the 2WC2-S Well Closure. Seal the open lines to prevent contaminants from entering the discharge line and the ST-1.

Remove the 2WC2-S Well Closure from the well head, and raise the pump and tubing with the suspension cable. Wrap the well closure and the pump assembly in clean plastic sheeting, and store in a secure place until the measurements have been completed.

After the measurements have been completed, reinstall the pump, well closure, and ST-1, and restart the system.

8.5 Performance Monitoring

The skimming pump assembly occupies the entire two-inch inside diameter of the well, and because of its size and design, does not allow water level or product thickness measurements, or water quality sampling to be performed without removing the skimming pump assembly from the well.

For all wells in the network, Burlington currently measures the water level and product thickness monthly, and obtains water quality samples quarterly. For the eight product wells, this schedule must be modified to avoid disrupting the recovery of product and to minimize the required removal of the skimming pump assembly from the wells.

Burlington has recorded the water levels and product thickness in each of the eight selected wells monthly since May 1993. This data base will serve as the baseline.

In the eight product recovery wells, water levels and product thickness measurements will be obtained at the first and second scheduled quarterly water quality sampling events after the system has been in continuous operation for a two-week period. Following the initial two quarterly measurements, water levels and product thickness measurements will

continue to be taken semi-annually. The same semi-annual schedule will be followed for obtaining water quality samples.

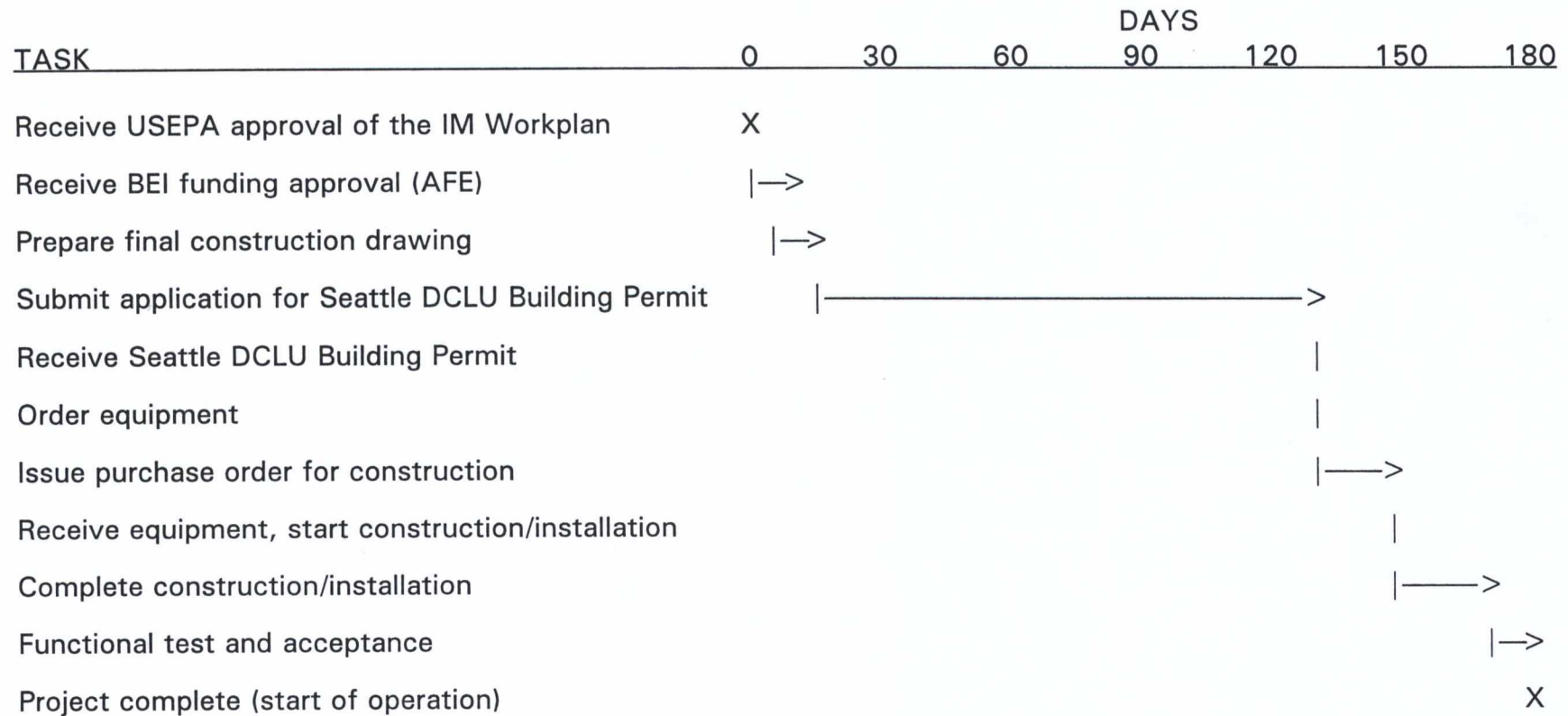
To allow the well to recover, water levels and product thickness measurements will be taken 48 hours after the pumping equipment has been removed. The equipment will be placed in clean plastic sheeting and returned to the well after obtaining water levels and product thickness measurements.

The quantity of product and groundwater recovered from the system will be recorded twice weekly for the initial six months of operation, and once weekly thereafter. The date and time of these measurements will also be recorded.

After one year of operation and annually thereafter, Burlington will evaluate the effectiveness of the system based on the quantity of product recovered and the rate of recovery throughout the previous years.

Table 9-1

PROJECT SCHEDULE
Pier 91 Interim Measures



Note: Schedule is initiated by USEPA approval of the Interim Measures Workplan.

This quality assurance plan covers the installation of the product recovery pumps and associated equipment to recover light non-aqueous phase liquids (LNAPLs) present on the upper (water table) aquifer beneath the tank system at the Burlington Environmental Inc. Pier 91 Facility.

The Burlington Project Engineer for the Pier 91 Interim Measures project is responsible for preparing, maintaining, and administering this Construction Quality Assurance Plan.

Design drawings shall be checked by the Burlington Project Engineer to assure that the design complies with building code, permit and regulatory requirements, and that the drawings clearly and accurately specify the means for complying with those requirements.

The equipment shall be selected and specified based on satisfactory use in similar applications. All equipment shall be inspected upon receipt to verify that it is the equipment ordered, that it has been delivered in satisfactory condition and that it has been properly decontaminated. The equipment shall be properly handled and stored after receipt and while awaiting installation.

The construction/installation contractor shall be selected based on satisfactory work on similar projects. The Burlington Project Engineer will monitor all phases of the contractors' work to verify that work of a satisfactory quality level is achieved. Results of all inspections and tests shall be documented in a project construction log book.

Upon satisfactory completion of the project, a mechanical completion certificate shall be completed by the Burlington Project Engineer. The certificate shall be signed by the Burlington Project Engineer, the contractor(s), and the operational unit responsible for operating and maintaining the product recovery system. The mechanical completion certificate shall be retained in the corrective action project files.

As described in Section 8.5, Performance Monitoring, water levels, product thickness measurements and water quality samples will be obtained at the first and second scheduled quarterly water quality sampling event, and semi-annually thereafter. The quantity of product and groundwater recovered from the system will be recorded twice weekly for the initial six months of operation, then once per week.

The data described above will be presented in the Bi-monthly Progress Reports currently required under the Burlington Pier 91 Facility RCRA Section 3008(h) Order. Upon issuance of a RCRA Section 3004 Permit rescinding the 3008(h) Order, the data will be presented per the 3004 permit.

The one-year report on the effectiveness of the product recovery system will be submitted within 30 days of completing one year of operation.



(Modified from Seattle North Washington, Quadrangle, USGS/NOS - 1983)

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Scale In Feet

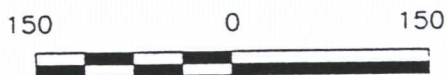
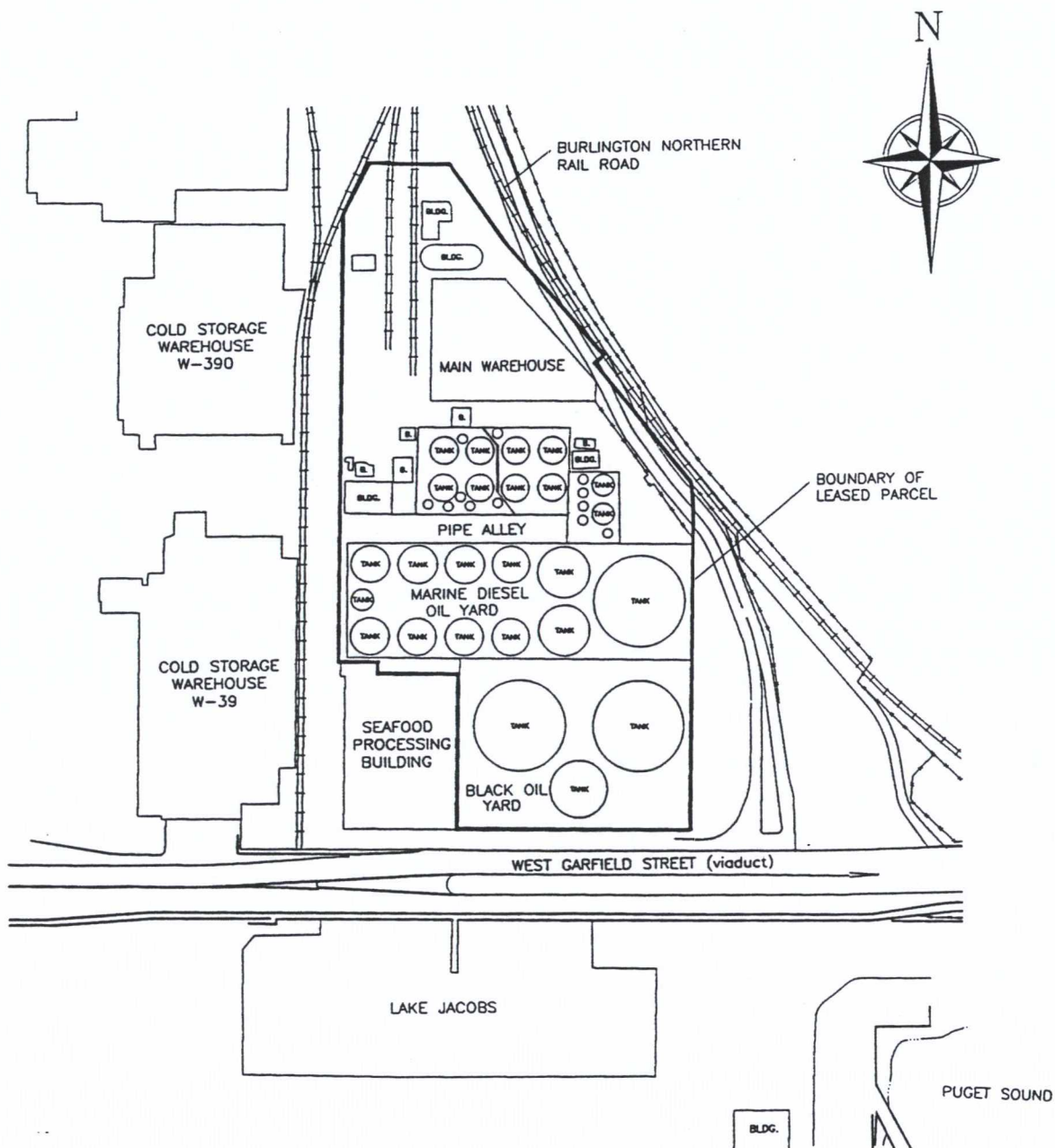


Burlington Environmental Inc.

BURLINGTON PIER 91 FACILITY
SITE LOCATION MAP

BURLINGTON PIER 91 RFI
SEATTLE, WASHINGTON
624878

FIGURE 1-1



SCALE 1" = 150'

All locations shown are approximate.



Burlington Environmental Inc.

BURLINGTON PIER 91 FACILITY

BURLINGTON PIER 91 RFI
SEATTLE, WASHINGTON
624878

FIGURE 1-2

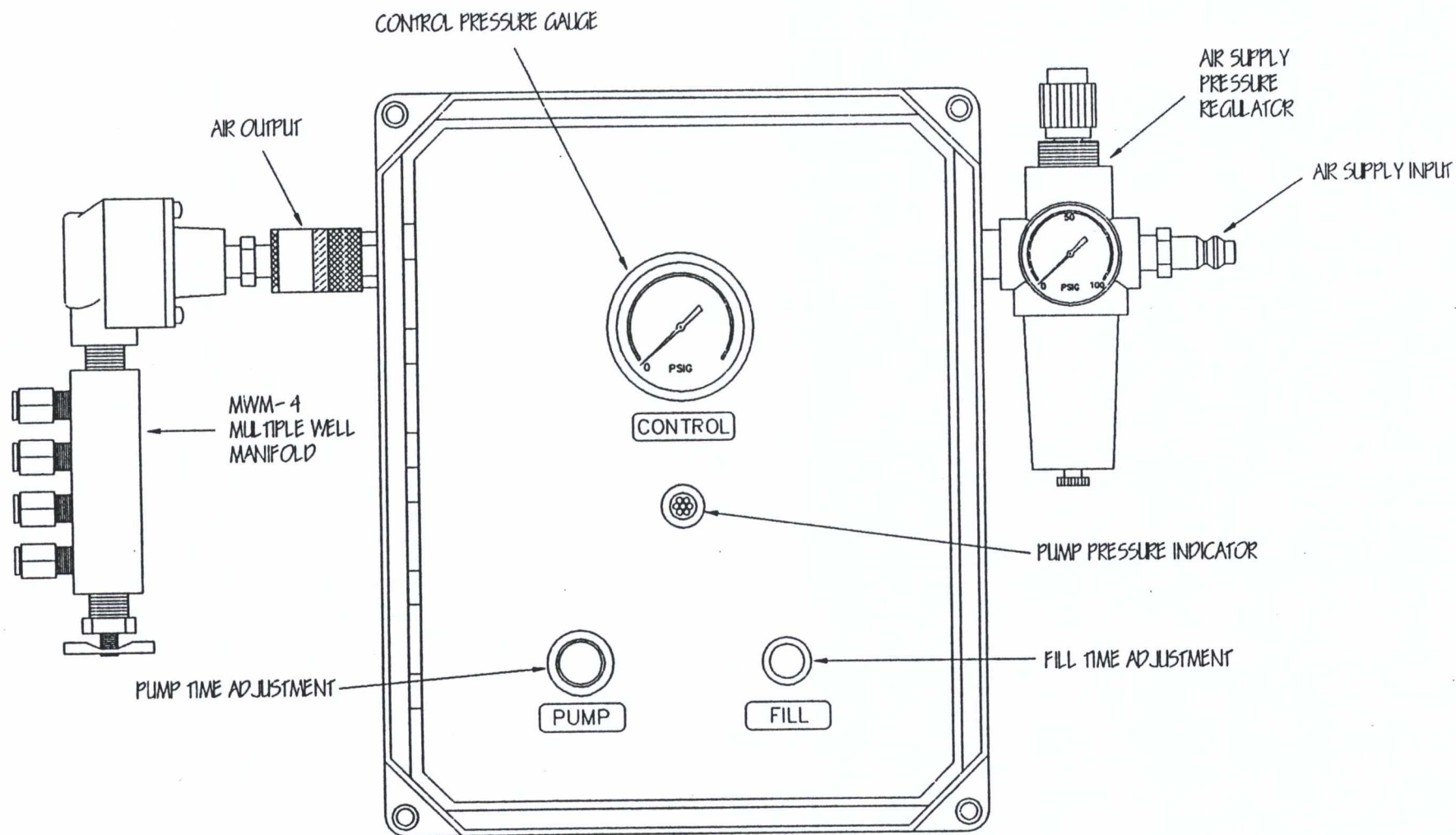


FIGURE 7-1

MODEL PC-1T WITH MWM-4 MULTIPLE WELL MANIFOLD

(PC-1T SHOWN WITH FRONT COVER REMOVED)

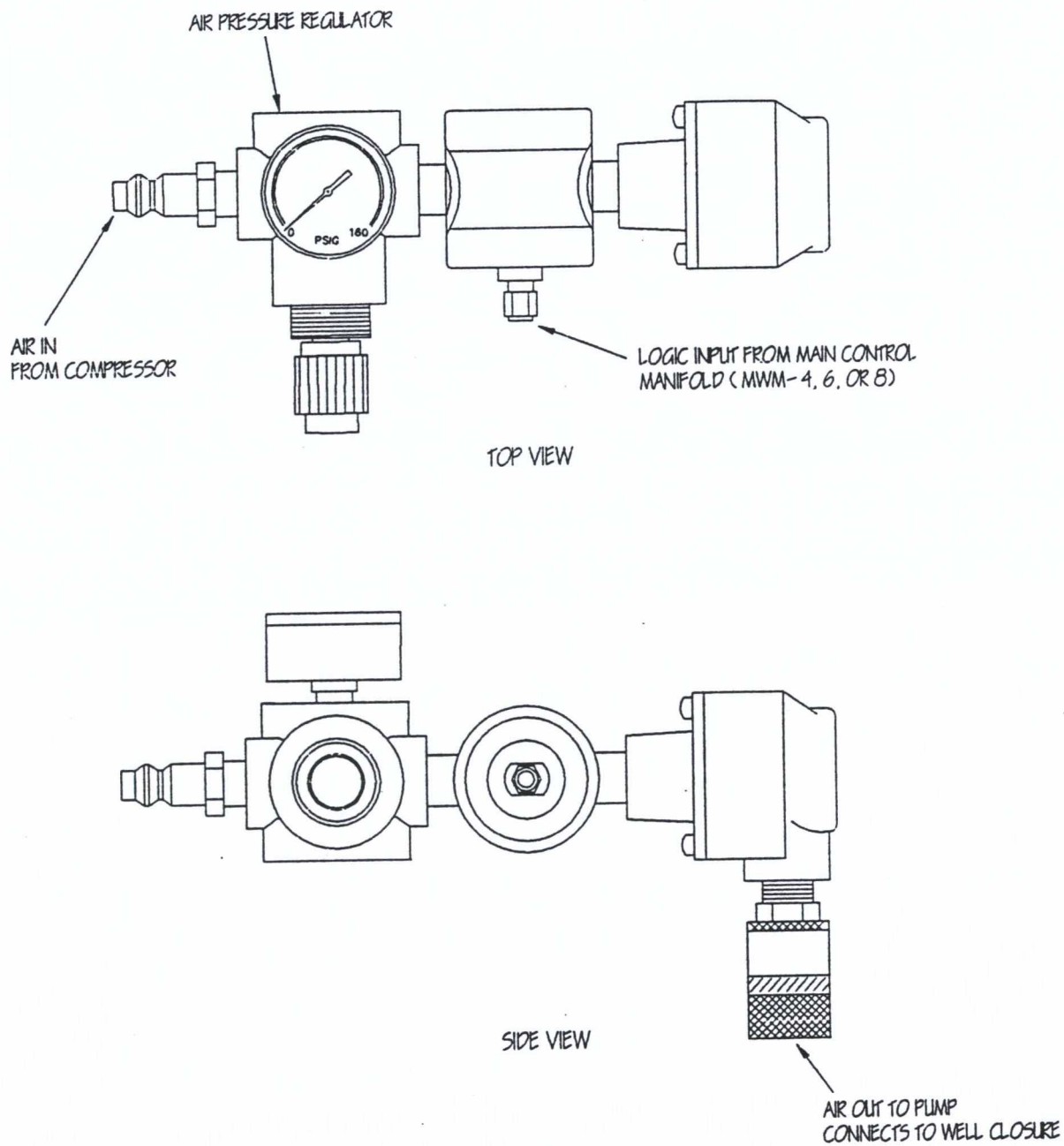


FIGURE 7-2

ST-1 SATELLITE CONTROLLER

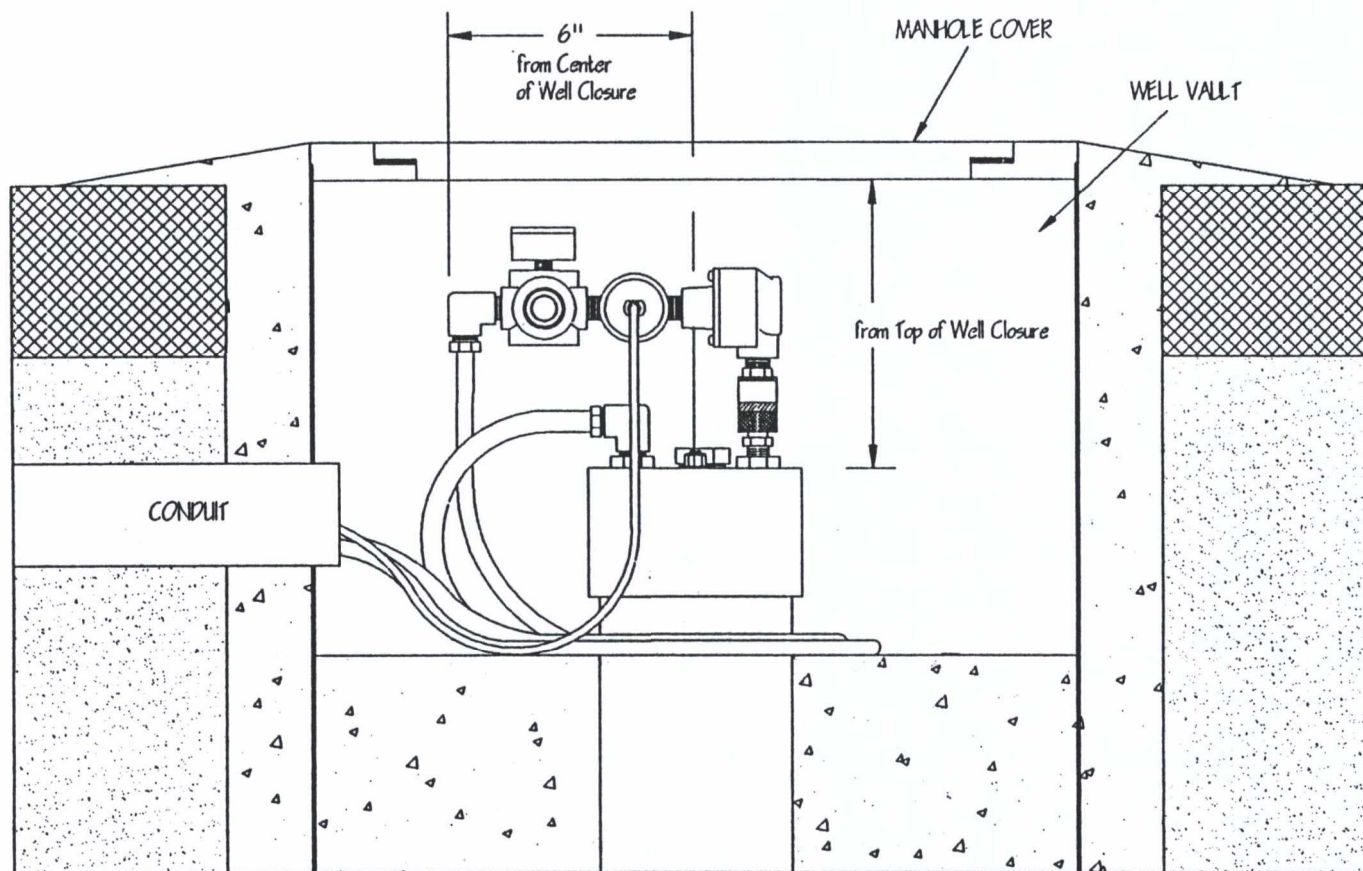
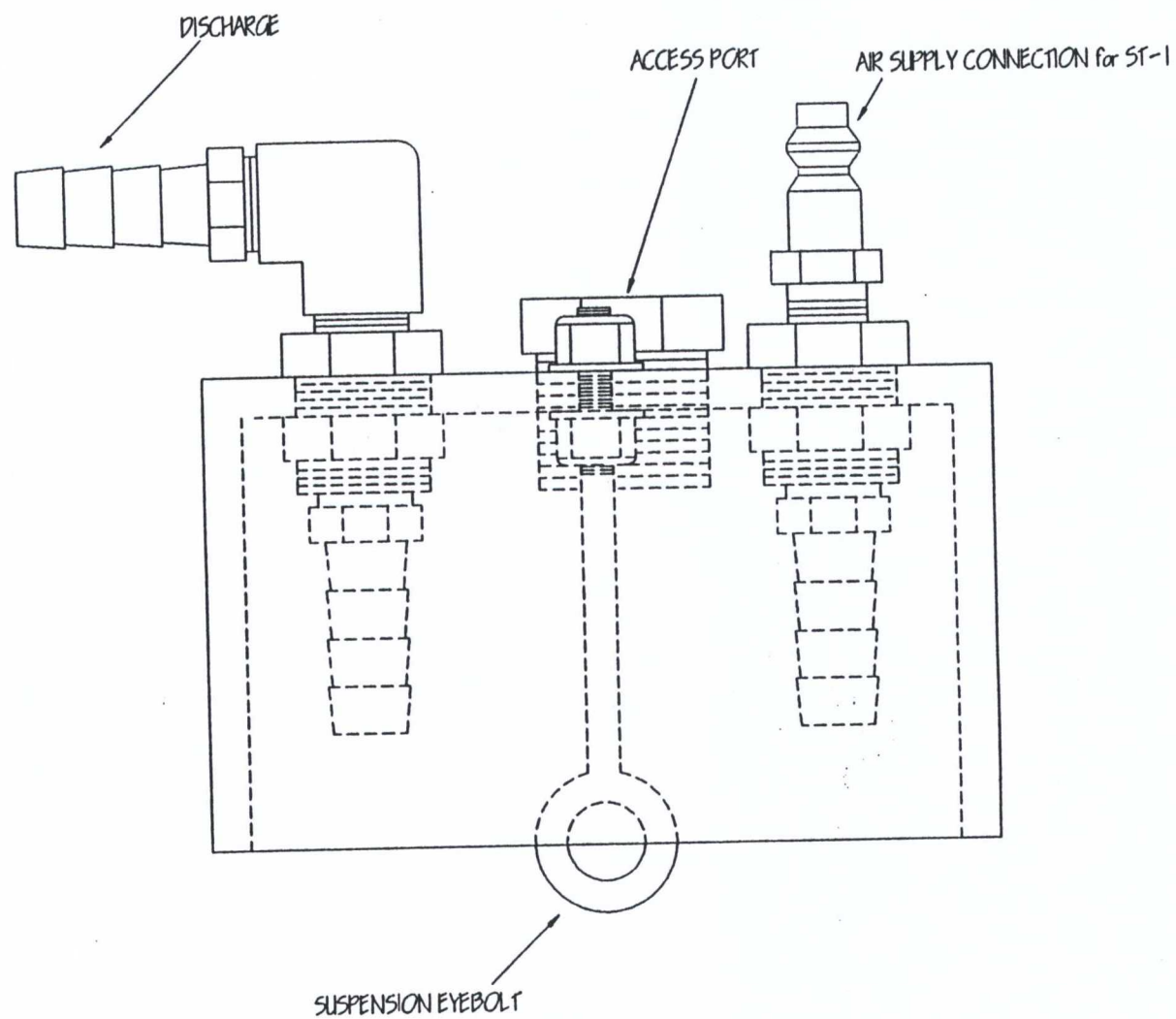
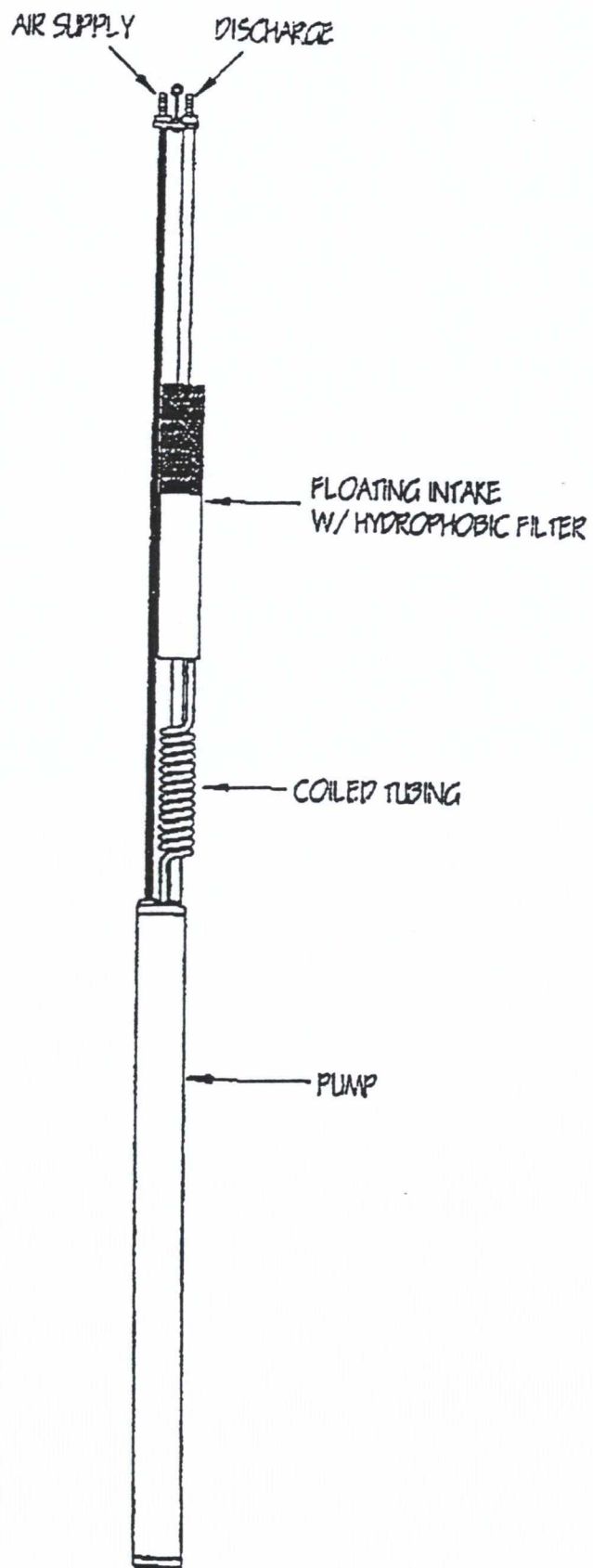


FIGURE 7-3 WELL VAULT CROSS-SECTION SHOWING TYPICAL INSTALLATION



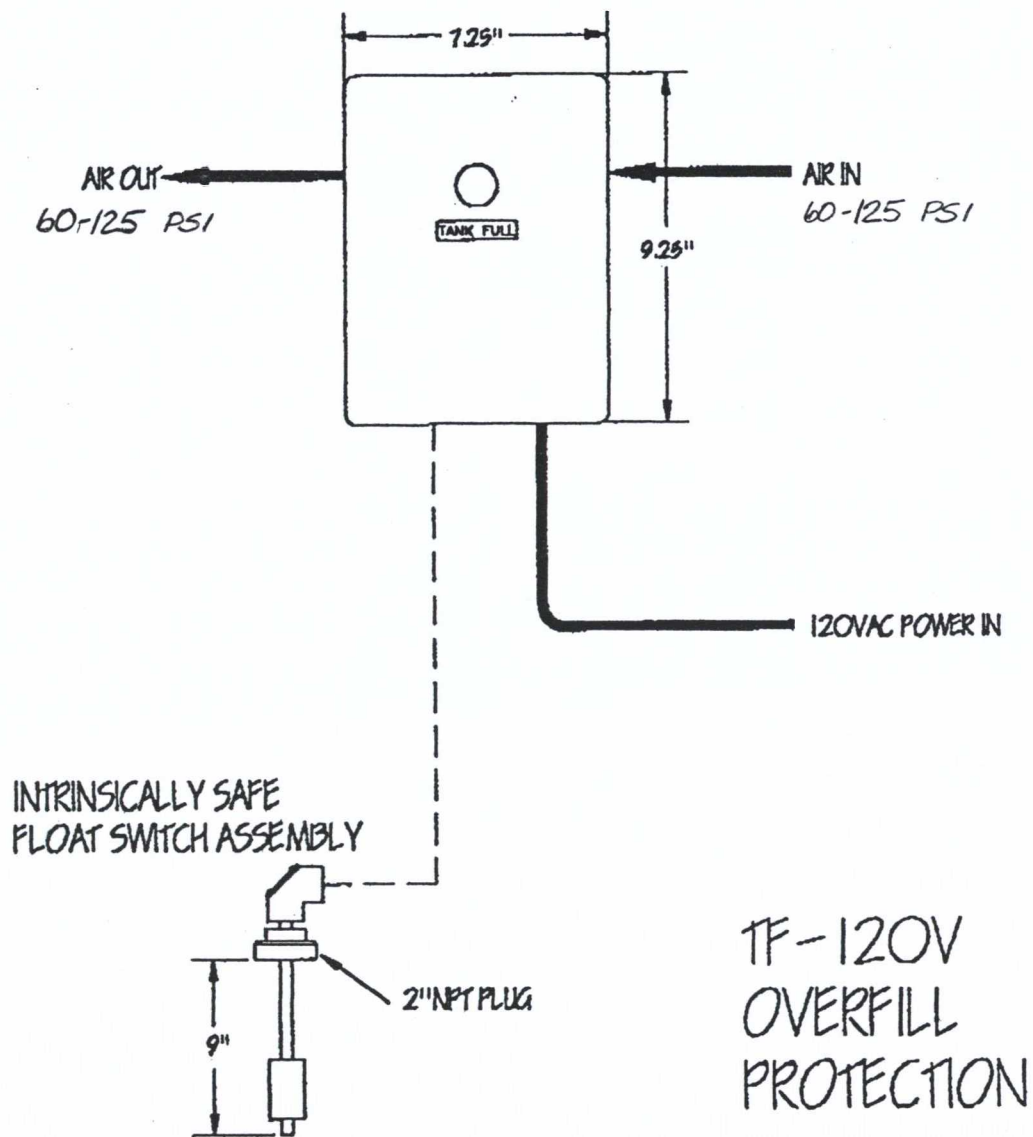
2 WC2-5 WELL CLOSURE

FIGURE 7-4



MODEL 2SK2 SKIMMING PUMP

FIGURE 7-5



TF-120V
OVERFILL
PROTECTION

FIGURE 7-6

LTR	REVISION	DATE/BY

NOTE:

1. APPROXIMATE ONLY. NOT TO BE USED FOR CALIBRATION.
2. ALL DIMENSIONS ARE APPROXIMATE AND SUBJECT TO VERIFICATION AFTER MANUFACTURE.

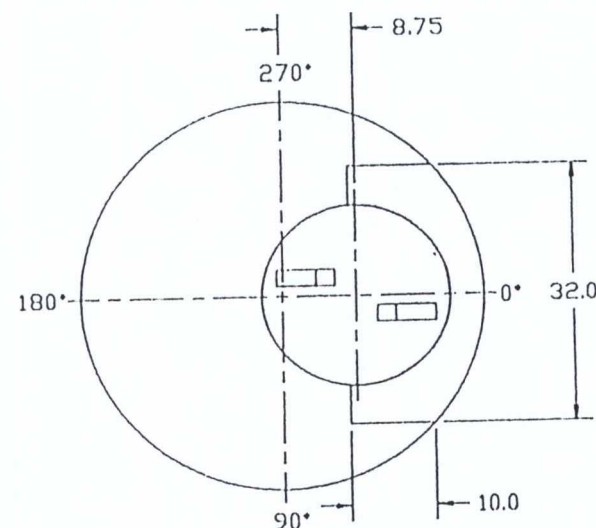
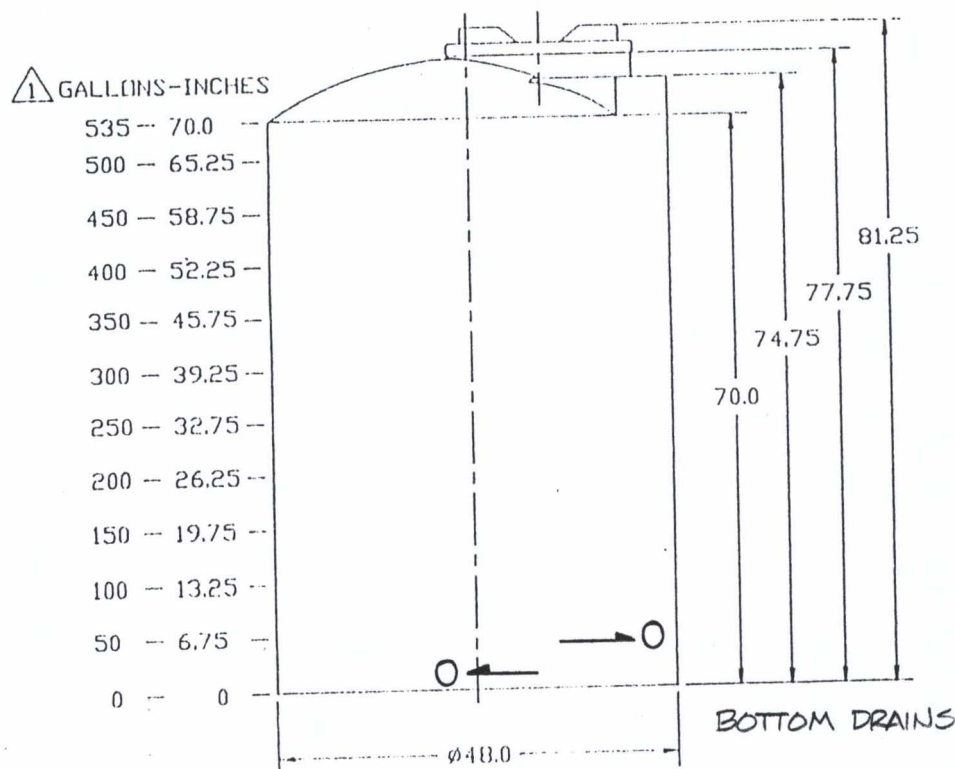


FIGURE 7-7

CAPACITY: 550 GALLONS	STOCK NO: SP-724-U
DIAMETER: 4'-0" OD	HEIGHT: AS SHOWN
WEIGHT: 140 LBS	MANWAY OPENING: ONE
DATE: 12-16-93	TOP: 17" ID. SIDE: NONE

VERSION:
CUSTOMER:
PLOT DATE: 12-16-93
PLOT SCALE: 15 : 1
FILE NAME: SP724U

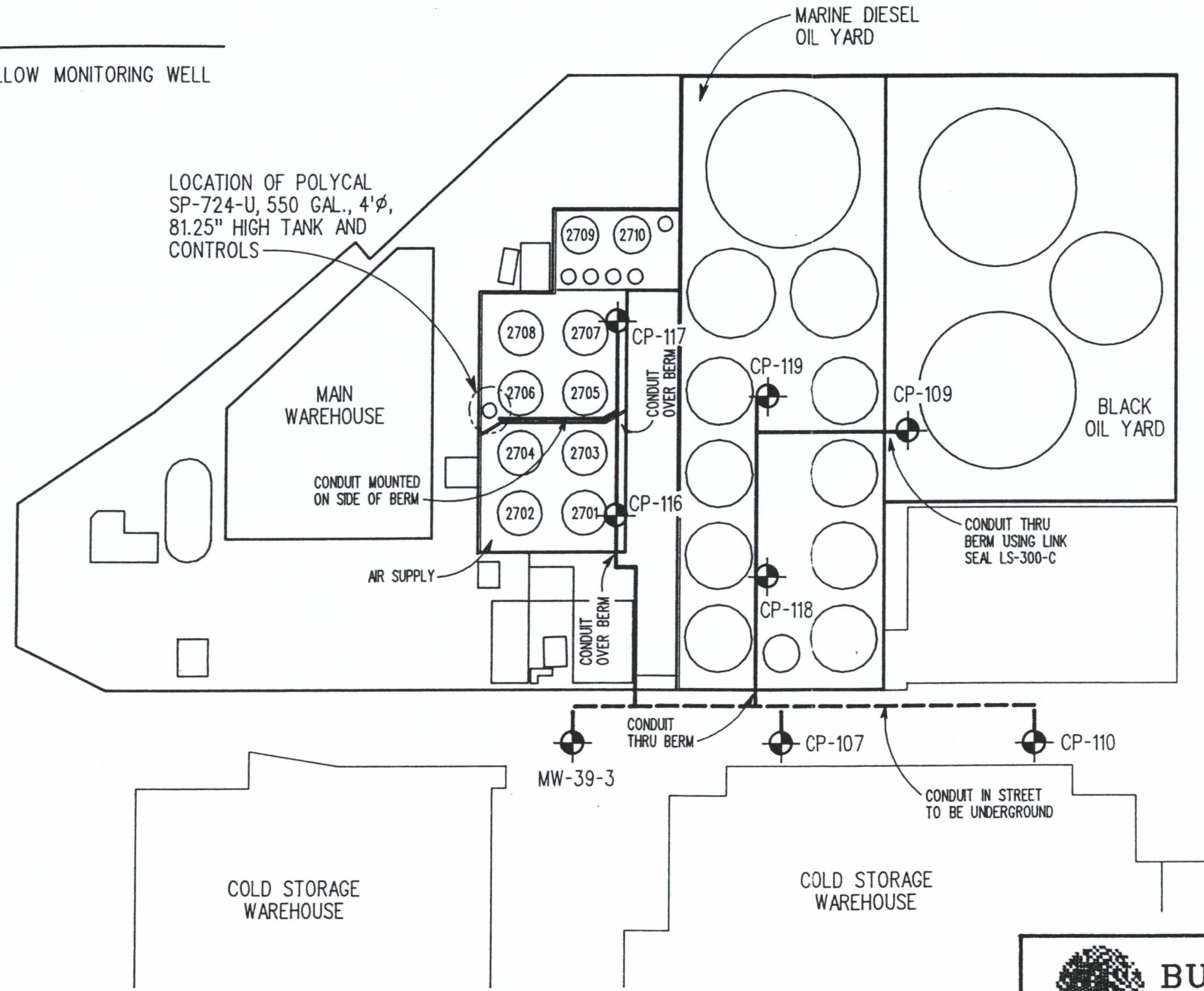
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES
INCHES: ±.10
DO NOT SCALE DRAWING

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550 GALLON UPRIGHT STORAGE TANK
POLY CAL PLASTICS
A DIVISION OF AMEL CORPORATION
8055 SOUTH ASH STREET
P.O. BOX 80
FRENCH CAMP, CALIF. 95231
STOCKTON EXCHANGE (209) 982-4904
TELEFAX NO. (209) 982-0455

LEGEND

SHALLOW MONITORING WELL



WEST GARFIELD ST.

NOTES:

- 1. USE 4" CONDUIT @ 18" FROSTLINE
- 2. ALL LOCATIONS SHOWN ARE APPROXIMATE

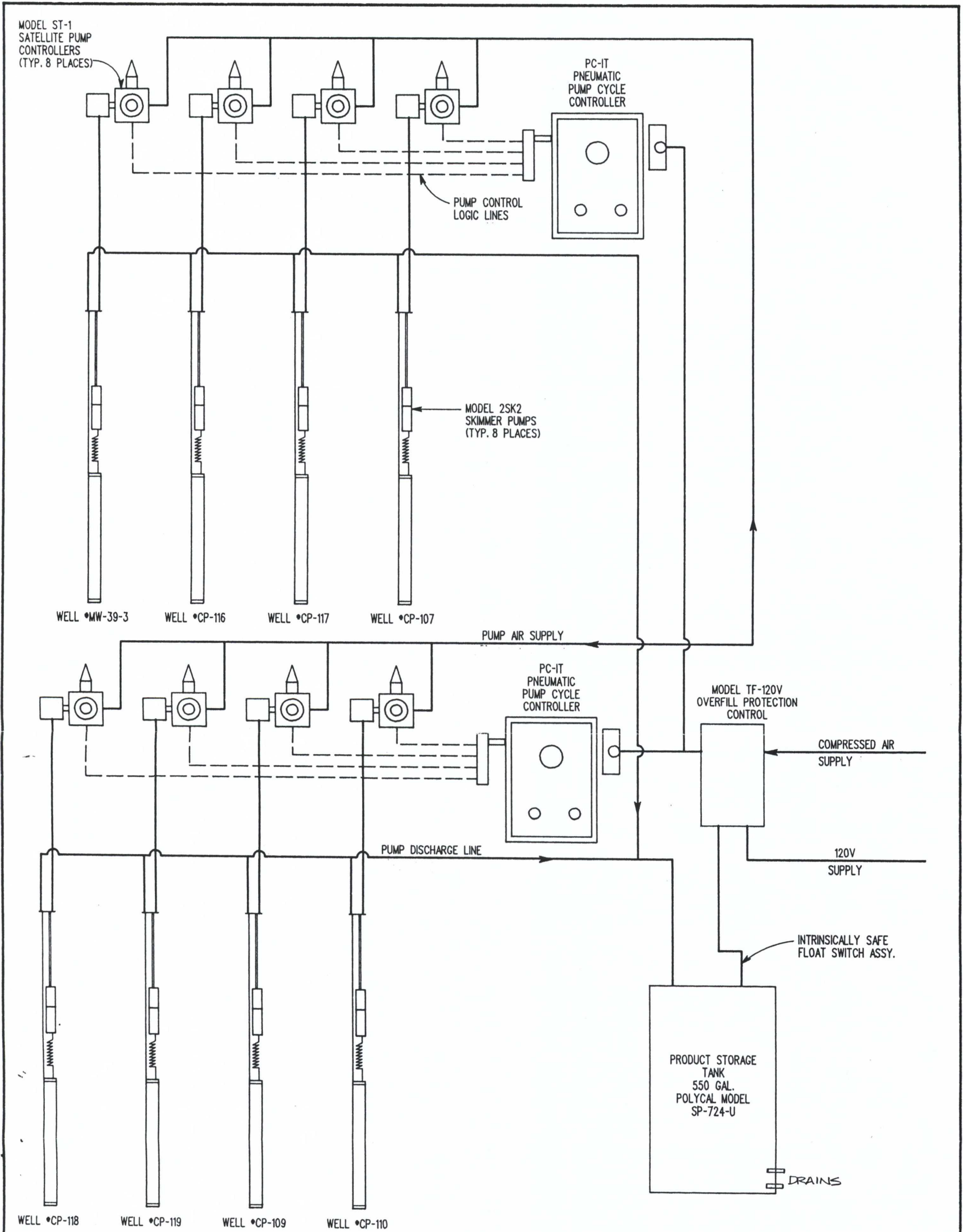
FILE: BEI50 .DGN



BURLINGTON ENVIRONMENTAL

FIGURE 8-1

SCALE: N.T.S.	PIER 91 FACILITY - INTERIM MEASURES	DRAWN BY: LMB
DATE: 02JUN94	LNAPL RECOVERY LAYOUT DRAWING	REVISED:
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NOTE:
ALL COMPONENTS EXCEPT TANK
MANUFACTURED BY TIERRA MADRE

FILE: BEI51 .DGN



**BURLINGTON
ENVIRONMENTAL**

FIGURE 8-2

SCALE: N.T.S.	PIER 91 FACILITY - INTERIM MEASURES	DRAWN BY: LMB
DATE: 02JUN94	LNAPL RECOVERY P & ID	REVISED:
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